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WAUKEGAN AREA

Lake County

Guide Leaflet 50-~~8~~ D

by

Gilbert O. Raasch

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ITINERARY

0.0		Caravan assembles on south side of Waukegan Township High School and headed SW on north side of Glenrock Avenue.
0.0	0.0	Turn left (S) on Jackson Street.
0.2	0.2	Traffic light. Continue ahead, turn immediately half-right (SW) on blacktop road. (Dugdale Avenue), and cross railroad.
0.7	0.9	Stop sign. Continue ahead (SW) on Dugdale Road. Route traverses rolling glacial topography of the Highland Park Moraine.
2.0	2.9	Stop sign. Turn diagonal left (SSE) on Route 131.
0.8	3.7	Caution. Entrance to Great Lakes Naval Training Center. Continue ahead on Route 131.
1.7	5.4	Stop. Intersection. STOP No. 1. Remain in cars.

Stop is on narrow crest of the Highland Park Moraine which runs in a general north-south direction and here slopes steeply on both its east and west sides. Highway 176 crosses the crest of the moraine, but the electric railroad runs through it in a deep cut.

When the rate of melting of the glacial ice balances the rate of the glacier's movement, the ice front remains stationary. Here the rock and earth pushed forward by the ice, and that freed by the melting of the ice, accumulate. When the glacier finally melts away, a ridge remains to mark the line of this ancient stalemate.

In Lake County 3 to 4 such ridges are present, roughly parallel to the lake and separated by marshy swales, sometimes with intermittent streams of which Skokie Creek is the most important. This set of moraines is called the Lake Border Moraine System, and belongs to the Cary Stage of the last, or Wisconsin, glaciation.

0.0	5.4	Turn left (east on Route 176) and descend east slope of Highland Park Moraine.
0.2	5.6	CAUTION. Railroad crossing and underpass.
0.1	5.7	Intersection. Go half right (SE) on Center Ave.
0.8	6.5	STOP No. 2. Descend to lake beach and walk south.

Except where protected by piers perpendicular to the shore (groins), the lake bluff is here being actively eroded by the waves. In places along the coast, points have thus been cut back over a mile.

The action of the waves undermines the cliffs of glacial till, and the undertow carries the sand off shore and the clay far out into the lake. In addition, the prevailing northerly winds cause a

south drift of shore currents. Where groins project into the lake, these interfere with the current and cause it to drop sand and gravel on the windward side of the groin. This along shore deposit then protects the cliffs from attack by the waves.

The action of the waves keeps fresh the exposure of glacial deposits in the cliffs. The major part of the bluff is made of glacial till, the unsorted mass of boulders, cobbles, pebbles, sand, and clay that was dropped by the melting of the glacial ice. Intermixed with this unsorted material are pockets and patches of sand and gravel, sorted from the till by the action of waters liberated by the melting ice.

A great variety of rocks is present in the till, and most of these have flat and striated sides, having been facetted by the grinding action of the ice. When these pebbles and cobbles fall upon the beach, the wave action rounds them to an average oval shape.

Many of the rocks in the till and on the beach were transported from the Upper Great Lakes and Canada Common types are the igneous rocks granite, diorite, gabbro, various porphyries, and basalt, metamorphic rocks such as gneiss, schist, quartzite, and jaspery taconite, and sedimentary rocks including red Lake Superior sandstone, and an abundance of local Mississippian blackshale and Devonian and Silurian limestone.

At the tops of the highest bluffs can be seen a thickness of bedded gravels which were deposited on top of the till at a time when the ice front evidently stood just east of the present shore. The waters from the melting ice probably were ponded between the Highland Park moraine to the west and the ice front to the east. The lake deposits underlie a flat plain at about 650 elevation in Lake Bluff and Lake Forest. (The present Lake Michigan level averages close to 580 feet.)

0.0	6.5	Turn right (S) along lake front.
0.1	6.6	Turn right (W) on Prospect Avenue.
0.3	6.9	Turn right (N) on Moffet Road.
0.1	7.0	Turn left (W) on Center Avenue.
0.4	7.4	Main intersection. Continue ahead (W) through underpass and across railroad.
0.2	7.6	Stop sign. Turn right (N) on Route 131.
1.7	9.3	Caution. Entrance to Great Lakes Naval Training Center. Continue ahead on Route 131.

0.3	9.6	Y-intersection. Continue ahead (N) on Route 131.
2.1	11.7	Stop sign; Route 120. Continue ahead (N) on Route 131.
1.5	13.2	Stop sign; Gurnee Road. Continue ahead (N) on Route 131.
2.7	15.9	Turn right (E) on gravel road at York Church.
1.2	17.1	Stop sign. Cross paved highway and continue ahead (E).
0.5	17.6	Jog right and cross railroad at Holdridge.
1.0	18.6	STOP No. 3. Glenwood Shoreline.

When the Wisconsin glacier stood along the line of the Lake Border Moraines, glacial ice completely filled the basin of Lake Michigan.

As the ice front retreated back northward up the lake basin, the portion freed of ice became open lake. Because the present outlet at the north end of Lake Michigan was blocked by the glacier, lake waters rose until they spilled over the divide into the Des Plaines Valley southwest of Chicago. Thence they flowed to the Illinois, the Mississippi, and the Gulf of Mexico.

This ancestor of Lake Michigan, called Lake Chicago, at first stood at a height of about 55 feet above the present lake. Just as today, the waves cut landward, formed wavecut banks and built sandy beaches. Alongshore currents built sand spits and bars. Today these still may be seen where the retiring lake waters abandoned them thousands of years ago.

We are parked on the wave cut flat of the highest or Glenwood stage of Lake Chicago. Just west is the old wavecut lake bank. In front of the house north of the road, glacial till is present, but the excavation for the new house on the southside of the road and east of the old bluff found only lakesand.

0.0	18.6	Continue ahead (E).
0.1	18.7	Stop sign. Turn left (N) on Sheridan Road (Route 42). This road runs most of its course to beyond the Wisconsin Line, on the old wavecut lake terrace.
0.7	19.4	Turn right (E) on road to Illinois Beach State Park, and descend wave cut cliff of Toleston Stage of Lake Chicago.
0.2	19.6	Caution. Railroad Crossing.
0.3	19.7	Enter State Park Gate.

The next mile the road passes eastward across swampy flats to wooded low sand ridges which parallel the lake shore. This area lies from 10 to 20 feet above the present lake.

1.4 21.1 STOP No. 4. Parking area at bathing beach. Walk north beyond bathing area.

The waves of the present lake are cutting into beach deposits made at an earlier time, when the lake waters stood 10 to 15 feet higher than they do today. This Toleston stage of Lake Chicago (or possibly its successor, Lake Algonquin) cut the now-wooded lake bluff west of the Chicago and Northwestern Railroad a mile to the west. Out here, near the present beach, a series of long narrow sand bars were built up close to the lake surface of that time.

When the lake retreated to its present level, the winds began moving the sand in the exposed bars, so that in places there are dunes today and in places "sand blows" or holes. Here, where the sand has been blown away by the wind, heavier materials are left behind, mainly pebbles, but also rarely Indian implements and fragments of bones, deer antlers, etc., as well as the trash of the present day.

0.0 19.7 Reverse route to Highway 42.

1.7 21.4 Stop sign. Turn right (N) on Route 42.

1.7 23.1 Traffic light in Zion. Continue ahead (N).

0.8 23.9 Junction with Route 173; continue ahead (N) on Route 42.

0.7 24.6 Enter Winthrop Harbor. Beach and wooded lake bluff excellently shown west (right) of road.

1.0 25.6 Turn right (E) between Greek columns.

0.1 25.7 Descend wavecut cliff of Calumet and Toleston stages of Lake Chicago.

0.2 25.9 Caution. Chicago and Northwestern Railroad.

1.0 26.9 STOP No. 5. Park on lake beach north of houses.

Again route has been over shallow, ridged bottom of the Toleston stage of Lake Chicago.

After the Glenwood, or highest, stage of Lake Chicago, the water level fell rather suddenly to a new level 20 feet lower. This lower lake level (35 feet above the present lake) is called the Calumet stage of Lake Chicago.

Once again the lake level fell probably to a level well below that of the present lake. It is thought that a low outlet to the north was uncovered for a time, and then blocked again by a readvance

of the ice. This readvance again backed up the lake waters to a height of 10-20 feet above the present lake. This third and lowest lake terrace marks the Toleston stage, when the broad sand flat between the Winthrop Harbor and the lake shore was formed.

A concentration of pebbles in places along the Winthrop Harbor beach makes this an excellent place to study a great variety of rocks.

0.0 26.9 Reverse route to Highway 42.

1.3 28.2 Stop sign. Cross Route 42 and continue ahead, ascending low Glenwood bluff to till plain upland.

0.2 28.4 Turn left (S) on moraine summit.

0.3 28.7 Turn right (W) on gravel road.

9.9 29.6 Caution. Railroad crossing.

9.4 30.0 Stop sign. Continue ahead (W) across paved highway.

0.5 30.5 Turn left (S) at North Prairie Church, on summit of Highland Park Moraine.

0.9 31.4 Turn right (W) on Route 173.

0.8 32.2 Stop sign. Route 131. Continue ahead (W).

0.9 33.1 Caution. Railroad crossing in swale between two Lake Border moraines.

1.2 34.3 STOP No. 5. On summit of Park Ridge Moraine, overlooking Des Plaines Valley to west.

In most of Illinois streams flow in valleys of their own carving. But in northeastern Illinois the time elapsed since the disappearance of the last ice sheet is so short that streams have not had time enough to carve valleys of their own. They wander listlessly through low places in the irregular till blanket left behind by the melting of the ice.

The valley west of us lies between the westernmost of the Lake Border Moraines (on which we stand) and the next moraine to the west, the Tinley Moraine. The Des Plaines river follows this long narrow depression between the two glacial ridges. Although it enters Illinois only six miles from the lakes shore, it flows southward parallel to shore between the two moraines for a distance of 22 miles and eventually empties into the old Lake Chicago outlet channel and the Illinois River.

The country to the west of the Des Plaines and on beyond the Fox River has a much more rolling topography full of small hillocks and undrained depressions, including those which bear the beautiful lakes of the Fox Lake district. In large part, this

this irregular topography seems to have arisen as a result of the Cary Glacier's over-riding an eroded glacial outwash plain of an earlier date. This outwash plain is believed to have been formed by the retreating Tazewell (early Wisconsin) Ice Sheet and to have been dissected by the erosion of the ancestral Fox River and its tributaries in the interval between the presence of the earlier Tazewell and the later Cary Ice Advances in the region.

As the Cary Glacier advanced, it dammed the ancestral Fox River near Elgin and backed up the waters to form a glacial lake which extended eastward nearly to Libertyville and Rosecrans, and northward into Wisconsin. As the glacier continued to advance, it obliterated this lake (called Lake Wauconda) and finally halted far west of the Fox River. The terminal moraine marking the farthest extent of Cary glaciation is called the West Chicago Moraine and is a part of the broad moraine belt known as the Valparaiso Moraine System.

0.0	34.3	Continue ahead (W), descending Park Ridge Moraine.
0.4	34.7	Caution. Cross Railroad.
0.6	35.3	Des Plaines River.
0.1	35.4	Junction with Route 41. End of conference.

Bon Voyage!

GEOLOGICAL COLUMN - WAUKEGAN AREA

ERAS		PERIODS	EPOCHS	REMARKS
Cenozoic "Recent Life"	Age of Mammals	Quaternary	Pleistocene	Wisconsin Glacial stage Lake Chicago stages Lake Border Glaciation Tinley Glaciation Valparaiso Glaciation Illinoian Glacial Stage Kansan Glacial Stage
		Tertiary	Pliocene Miocene Oligocene Eocene Paleocene	Not present in the Waukegan Area.
Mesozoic "Middle Life"	Age of Reptiles	Cretaceous		Not present in the Waukegan Area
		Jurassic		Not present in Illinois
		Triassic		Not present in Illinois
Paleozoic "Ancient Life"	Age of Amphibians and Early Plants	Permian		Not present in Illinois
		Pennsylvanian		Not present in Waukegan Area.
		Mississippian		Not present in Waukegan Area.
	Age of Fish	Devonian		Not present in Waukegan Area.
	Age of Invertebrates	Silurian	Cayugan	Not present in Illinois.
			Niagaran	Niagaran dolomites in wells
			Alexandrian	Kankakee dol. found in deep wells. Edgewood Dol. & Sh. found in deep wells.
		Ordovician	Upper	Maquoketa Shale.
			Middle	Galena Dolomite Platteville Limestone Glenwood Sandstone St. Peter Sandstone
			Lower	Oneota cherty dolomite.
		Cambrian	Upper	Trempealeau Formation. Franconia ss. & sh. Galesville sandstone. Eau Claire ss. & sh. Mt. Simon sandstone.
			Middle	Not present in Illinois.
			Lower	Not present in Illinois.
Proterozoic		Referred to as Pre-Cambrian Time.		No Data Available.
Archeozoic				

GEOLOGICAL HISTORY OF LAKE COUNTY

The crystalline or "granite" basement, on which the bedrock layers of Illinois rest, has never been reached by even the deepest of wells drilled in Lake County. But wells drilled farther west and north reveal the presence of this ancient basement, which comes to the surface in central Wisconsin and over much of central and northeastern Canada. Some of the rocks of this "basement complex" were once sandstone and shale--others, lava flows or rocks which formed when molten masses cooled and hardened deep underground. They exist today highly twisted, altered and intermingled as a result of mountain making movements of the ancient past. These rocks belong to the Archeozoic and Proterozoic Eras of Geologic Time.

When the last great mountain building disturbance in this region was past, erosion working through an immense span of time wore the mountain masses down to a nearly level plain, called a peneplain. In the Era that followed, the Cambrian sea advanced across this nearly level surface, and deposited thick layers of sand and of lime mud which hardened to sandstone and dolomite. The remains of the sea animals of the time, protected by the hardening of the sediment, remain today as fossils. Through much of the remainder of the Paleozoic Era, the region continued beneath the water of shallow primordial seas that invaded the interior of the continent. The latest bedrock deposit of these ancient seas that still is present beneath the cover of glacial drift in Lake County is the Niagara Dolomite of Silurian Age. But there is reason to believe that deposits of later Paleozoic seas were once laid down over the region.

The Silurian Period is particularly interesting as the first in which coral reefs were built. Many of these are exposed today in the quarries about Chicago, Racine, and Milwaukee. They show that besides the reef building corals, many other forms of ancient sea life swarmed in the warm clear waters of those days.

Toward the close of the Paleozoic Era sea waters withdrew from the region never to return. The land was uplifted to a moderate elevation above the sea, and through a span of time amounting to hundreds of millions of years, erosion slowly stripped away the rock layers that once overlay the Niagara Dolomite. Thus during the long span of time which saw the dinosaurs rise and fall and be succeeded by the varied mammalian life of the Tertiary, no permanent deposits were laid down in the region and no rocks formed.

Erosion developed a great southward trending valley to the west in the Rockford Area and another, northward trending, where the middle of Lake Michigan is today. But the Waukegan area was an upland, cut by short streams running to the great eastern river.

The next series of events of which there is a detailed record in the region took place only yesterday, geologically speaking, in the Pleistocene Period. This "Ice Age" is estimated to have begun a scant million years ago when ice sheets began moving down from Canadian centers of accumulation. Four distinct advances are known to have taken place, with long intervals between, when the climate turned as mild or milder then today. Of the four major invasions, all but the first appear to have crossed the Waukegan region, but quite naturally only the last or Wisconsin glaciation can be studied in detail.

Many of the land forms resulting from this glaciation still exist much as the glacier and the glacial waters left them, which is quite understandable, since the last of the glaciers is estimated to have vanished less than 25,000 years ago. There is, in fact, no way of determining whether or not we are not today living in just another interglacial period, which may be ended a couple of hundred thousand years from now, by the formation and advance of a fifth continental ice sheet.

RECOMMENDED REFERENCES

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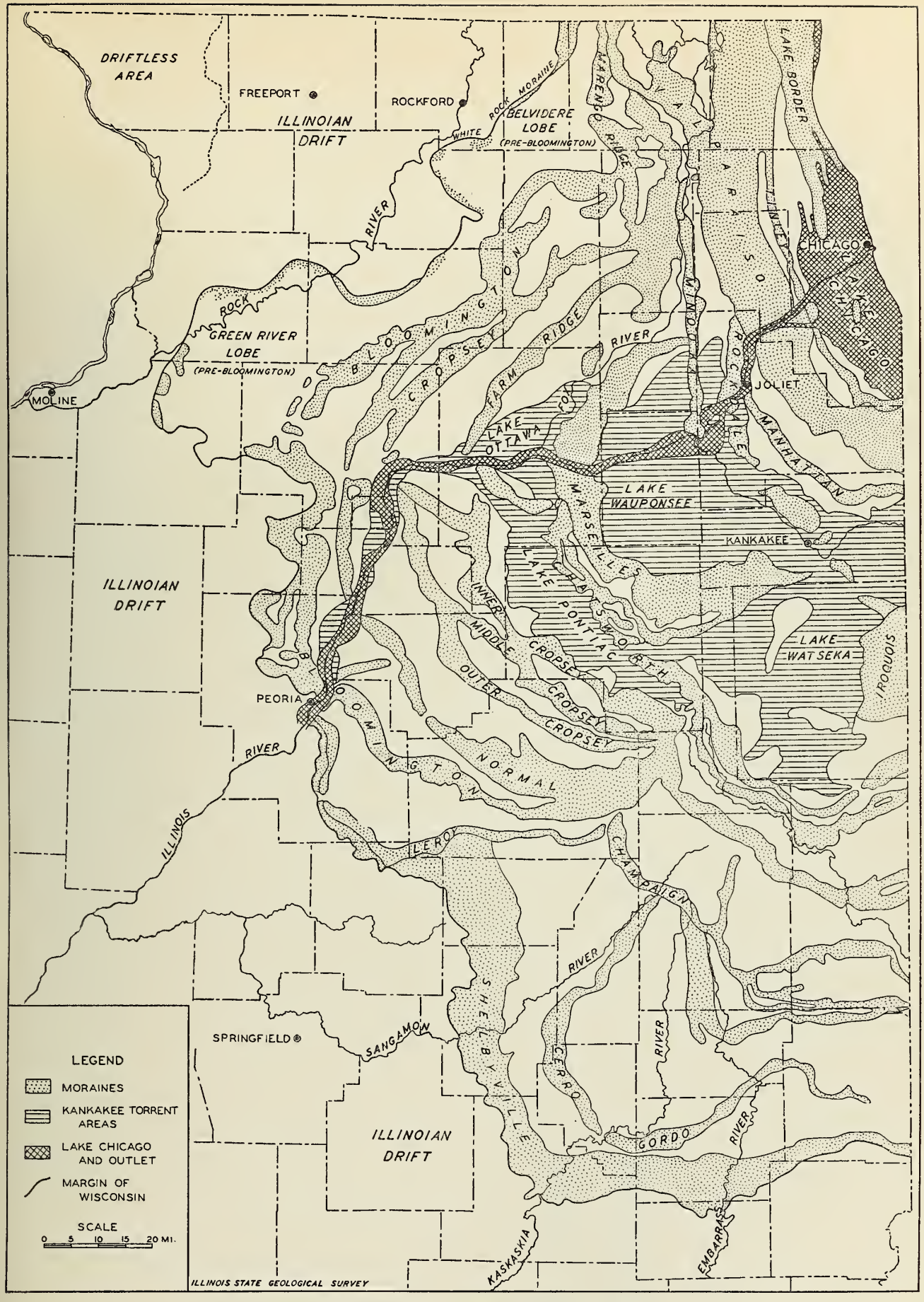

GLACIAL GEOLOGY IN NORTHEASTERN ILLINOIS
Compiled by George E. Ekblaw from data furnished by the Survey
January 1, 1942

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